Chapter 2

Organizations and Systems Capabilities and Limitations

This chapter provides an overview of assets available to FA commanders for the delivery of timely and accurate FA fires within the context of missions, roles, and responsibilities described in Chapter 1. It starts with an organizational overview of corps, division, and brigade artilleries. The chapter closes with an overview of intelligence and TA systems. Supporting C3 systems are addressed separately in Appendix I.

SECTION I - FIELD ARTILLERY ORGANIZATIONS

2-1. The headquarters and headquarters battery (HHB) is the organization that provides corps arty, div arty, and FA brigade commanders the necessary C2 and sustainment infrastructure to accomplish their FS and FA missions. The actual firepower is found in FA cannon and MLRS battalions and supporting survey, TA, and meteorology units.

CORPS ARTILLERY

2-2. Corps arty plans, coordinates, and executes corps FA operations and provides C2 over subordinate FA brigades. As indicated in Figure 2-1, a typical corps arty consists of an HHB (Section I, Appendix E), FA brigades, and TA assets. The number of deployed FA brigades is based on theater requirements: normally one or two remain under corps control to provide GS fires with others augmenting the fires of committed subordinate divisions; two augment the fires of each committed subordinate division.

2-3. Corps arty normally retains all ATACMS missiles and some multiple rocket units for increased flexibility and responsiveness in support of the corps deep battle and counterfire operations. AN/TPQ-37 radars in the TA detachment may also be retained at corps for maximum centralized support, mission tailored and attached to FA brigades for counterfire or TMD operations, or attached to MLRS battalions to establish a direct sensor-to-shooter linkage (for details on specific capabilities see FM 6-121, *Tactics, Techniques, and Procedures for Field Artillery Target Acquisition*).

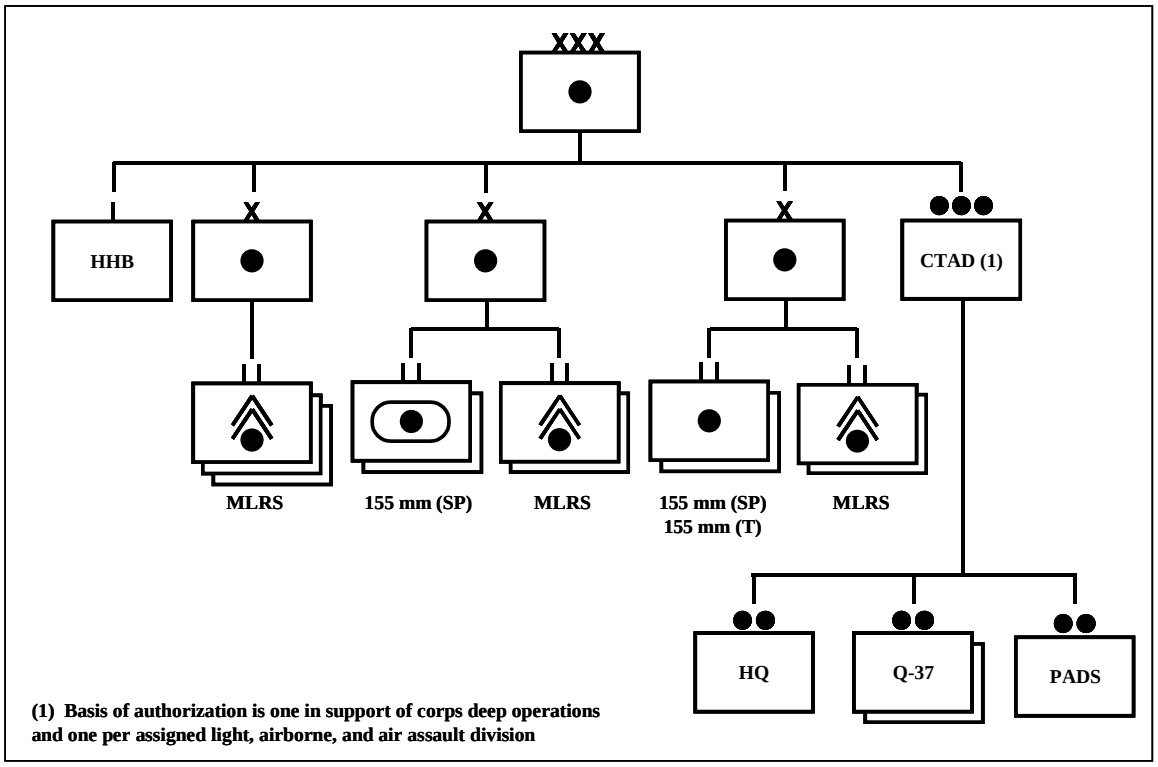

Figure 2-1. Notional Corps Arty Organization

DIVISION ARTILLERY

GENERAL

2-4. Div arty controls the division's organic and attached FA units and indirect FS operations, providing an FSE for continuous operations to division main, tactical, and rear CPs. To win a major theater war quickly, decisively, and with minimum friendly casualties, each division must be supported with the fires of two fully modernized FA brigades equipped with cannons and MLRS launchers.

2-5. The div arty HHB provides the personnel, equipment, and logistic support for div arty CPs and division FSEs. Individual differences among heavy, light infantry, airborne, and air assault div arty HHBs are as indicated in Section II, Appendix E.

ARMORED AND MECHANIZED INFANTRY DIVISION ARTILLERY

2-6. Each armored and mechanized infantry div arty is organized with an HHB and three 155mm SP howitzer battalions (three six-gun howitzer batteries - one battalion in DS of each committed maneuver brigade). In addition, a 3X6 division MLRS battalion with an organic TAB provides fires for the division (Figure 2-2). One AN/TPQ-36 radar section from the TAB is normally attached to each DS battalion supporting a committed brigade. The remainders to include AN/TPQ-37 radars are usually retained in GS of the division. For detailed information on TAB operations see FM 6-121.

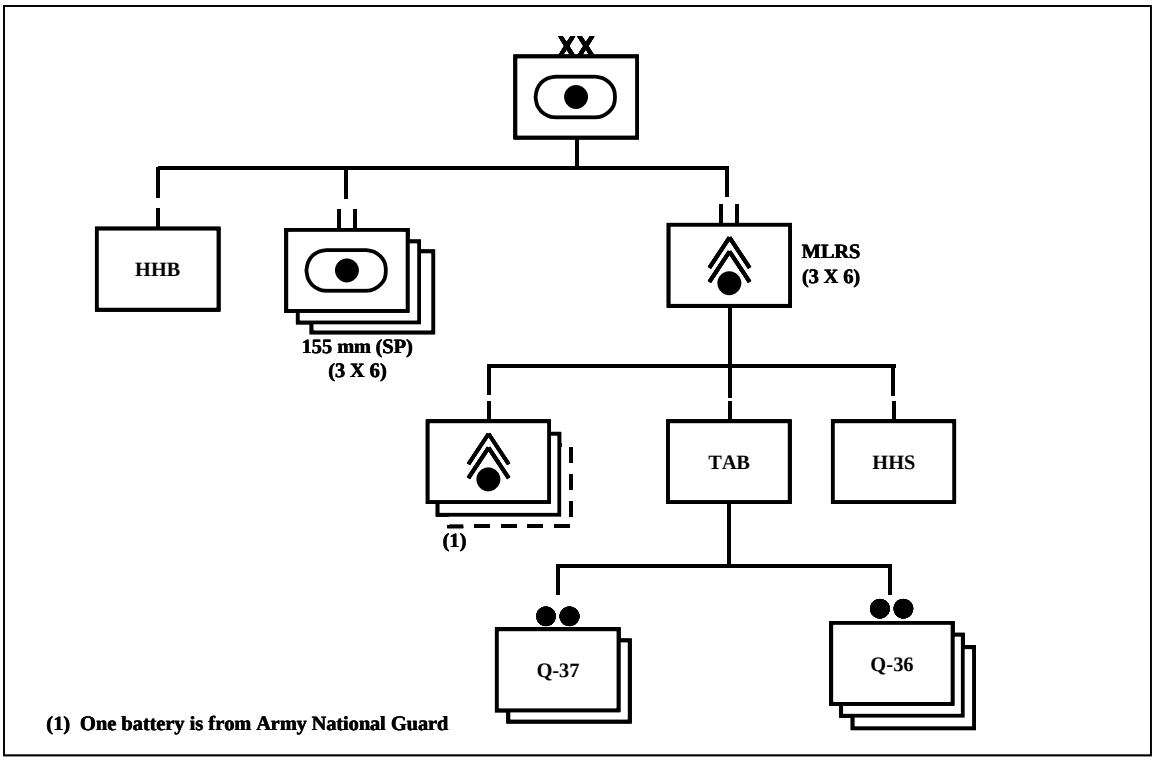

Figure 2-2. Heavy Div Arty Organization

LIGHT DIVISION ARTILLERY

2-7. Light infantry, air assault, and airborne infantry divisions are designed to make optimum use of offensive, decentralized, irregular-type operations by highly trained small units. Although their method of initial deployment and employment requires specialized skills, the organization of organic FA units is similar. However, for deployment purposes, the Army considers the air assault division a “heavy” division.

2-8. In contrast to heavy div artys, light div artys are more austere in terms of manning, equipment and logistic support. As indicated in Section II, Appendix E, the major differences with heavy div artys in HHBs are the absence of liaison and ambulance sections, the wire team, and cavalry troop fire support teams (FISTs). Also, as indicated in Figure 2-3, organic howitzers supporting divisional maneuver brigades are limited to three DS 105mm towed (T) howitzer battalions. Although light infantry divisions are supported by an organic six-gun 155mm towed howitzer battery, airborne and air assault div artys have to depend on reinforcing fires from supporting corps FA brigades and battalions. An additional significant difference with heavy divisions is the absence of an organic TAB. This limitation is partially overcome by one AN/TPQ-36 radar organic to each DS battalion and a two-section AN/TPQ-37 corps target acquisition detachment (CTAD) attached by corps to each committed light, airborne, or airmobile division.

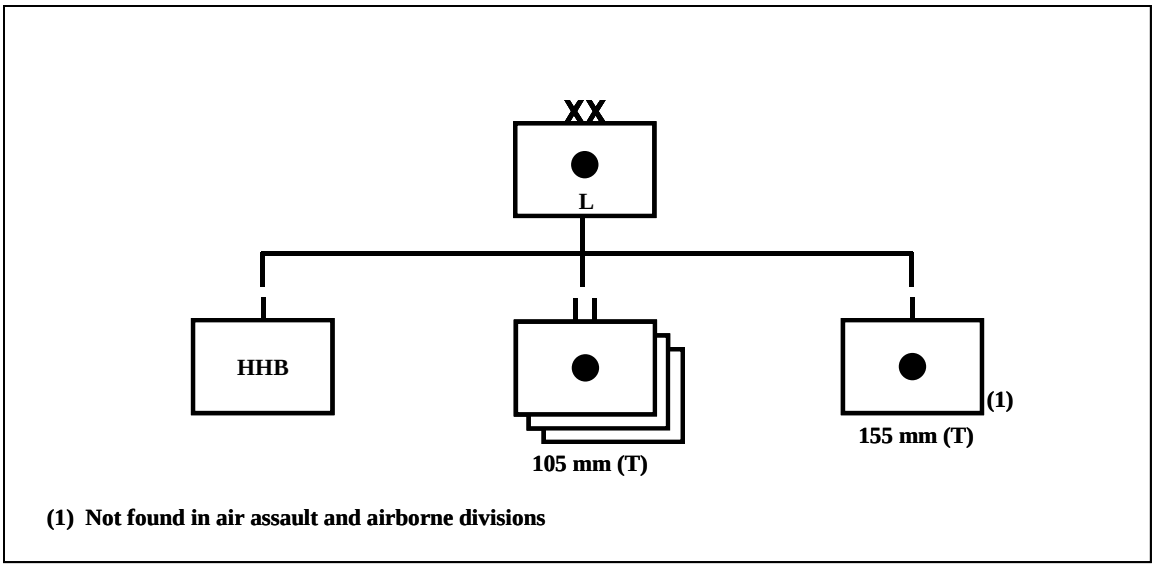

Figure 2-3. Light Div Arty Organization

2-9. FA operations in nonheavy divisions may also be challenged by a number of unique requirements and limitations. For example, in the case of the air assault division, aviation brigades are employed in high tempo, conventional offensive operations capitalizing on vertical envelopment. They habitually operate beyond the range of their DS tube artillery, unless accompanied by them. To employ FA cannon fires, FA batteries are required to join maneuver elements in air assault operations into or adjacent to maneuver unit landing zones. Also:

- Reinforcing SP tube and missile units cannot accompany air assault operations.
- Air assault operations and deep aviation attacks in the deep area consume large quantities of ammunition to suppress, neutralize, and destroy enemy air defenses, FS, and mobile reserves.

FIELD ARTILLERY BRIGADE

2-10. The FA brigade HHB (Section III, Appendix E) provides the C2 and CSS infrastructure to fight three to five attached FA cannon or MLRS battalions. It is a highly flexible, intermediate C2 structure, capable of changing task organization. Brigades are tailored prior to deployment to meet initial theater requirements. After arrival in theater, the type and caliber of assigned battalions can be tailored based on mission, number of units available and corps FA support requirements, which frequently change with the tactical situation.

2-11. An example FA brigade organization in support of a heavy division is shown in Figure 2-4. Although similar in size and structure to div artys, FA brigades have no permanent command relationship with a maneuver HQ. Unlike div artys, FA brigades may be routinely assigned any of the four standard FA tactical missions. However, FSEs and FISTs are not organic to FA brigades. When FA brigades or their subordinate battalions are assigned a DS tactical mission, they have to be provided augmentation. This augmentation

may come from the supporting maneuver unit's DS battalion. FA brigades also have to rely on corps or divisions for TA assets unless task-organized with corps arty TA assets. They also depend on logistical support from corps and/or divisional support elements on an area support basis.

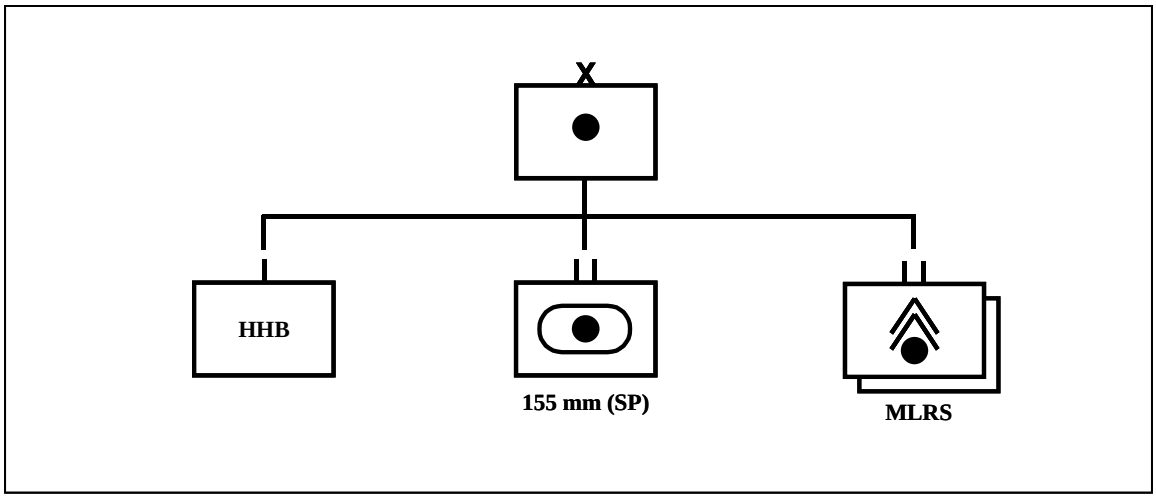

Figure 2-4. Notional FA Brigade Organization

US MARINE CORPS ARTILLERY REGIMENT

2-12. Each Marine division has an organic artillery regiment. The regiment and its subordinate elements are capable of deploying with and supporting the ground combat element (GCE) of any size MAGTF. For combat, the artillery regiment will have a HQ battery and five artillery battalions (three six-gun towed 155mm howitzer batteries) to support the GCE of a Marine expeditionary force (MEF) (Figure 2-5). Within the HQ battery, the counterbattery radar platoon consists of four AN/TPQ-36 radar sections. One radar section is normally attached to each DS battalion supporting a committed infantry regiment. The remainder is retained in GS of the division.

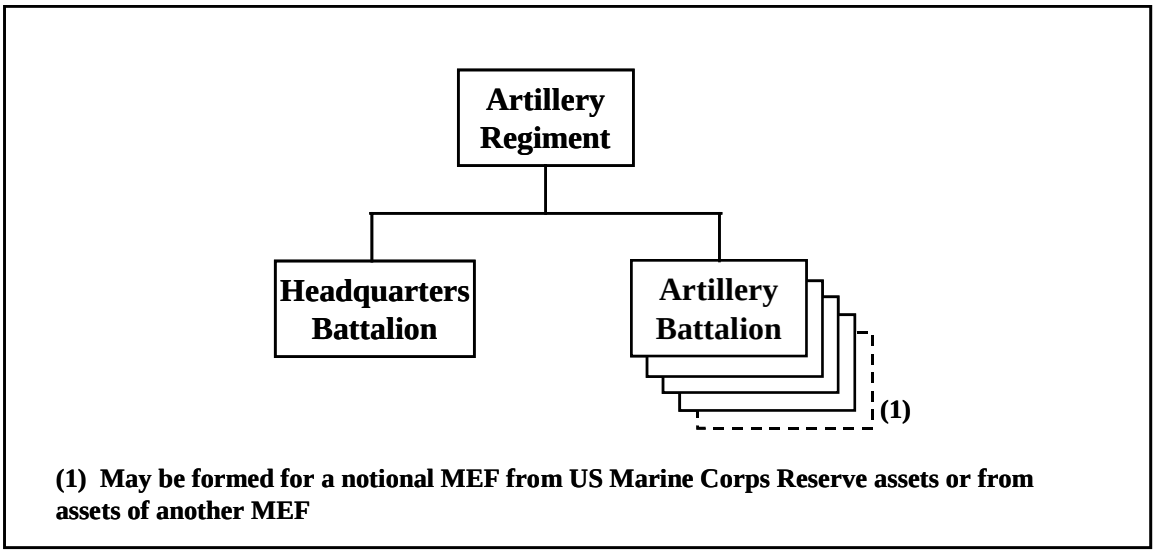

Figure 2-5. USMC Artillery Regiment

2-13. The regimental HQ battery has functional staff groupings to assist the regimental commander in the control of operations, CSS, and administrative support of the regiment (Section IV, Appendix E). The HQ battery provides the equipment and personnel for the regiment command echelons and the division FSCC. Personnel and sections of the HQ battery also may be employed to reinforce an artillery battalion operating independently of the regiment. The regimental HQ may be employed in two echelons: a main echelon, which has the necessary staff and equipment to direct tactical operations; and the rear echelon, which has the necessary staff and equipment to direct sustainment operations. A forward echelon may be formed from the staff and equipment of the main echelon to facilitate the incremental displacement of the main echelon. COCs are formed at each echelon to plan, direct, control, and coordinate assigned functions. The regimental COC performs tactical fire direction, targeting, and counterfire functions. The regimental commander positions himself where he can best exercise C2 of the regiment and function as the division artillery officer and fire support coordinator (FSC) (USMC). The regimental CP is that echelon where the commander is located.

SECTION II - INTELLIGENCE AND TARGET ACQUISITION SYSTEMS

GENERAL

2-14. Success in battle relies heavily on the ability to accurately identify, locate, and attack critical targets. This calls for rapid and accurate target development, TA, and poststrike assessments. The following systems, supported by advanced sensors and processors, provide the foundation for the delivery of timely and effective FA fires in support of the close and rear battle and deep strikes.

INTELLIGENCE FORCE STRUCTURE

2-15. Corps military intelligence (MI) brigades integrate intelligence collected by organic MI assets and theater and national level assets to support the corps deep battle. They also draw on other theater, coalition, and national sources. MI battalions at division level provide processing, imagery, and signals and human intelligence (SIGINT/HUMINT) capabilities in support of div arty FA and brigade operations. Intelligence and analysis operations at corps and division have been concentrated in a single hub, the analysis and control element (ACE). The ACE, equipped with ASAS, streamlines collection management, processing, analysis, and fusion functions.

2-16. The collection, processing and dissemination of intelligence information supporting corps arty, div arty, and FA brigade operations are the responsibility of the respective G2s/S2s. Most intelligence and targeting sources and assets, except for FA-internal sources and AN/TPQ-36/Q-37 radars, are under the purview of external commands and agencies; therefore, successful performance of FA intelligence functions depends greatly on the field artillery intelligence officer's (FAIO's) ability to provide effective interface with higher, lower, adjacent, and lateral G2/S2 elements for situation development and target attack. See FM 6-121 for more detailed duties of the FAIO. In the case of corps arty, this includes a consistent dialogue with the corps G2/ACE; FA intelligence representatives in corps main, tactical, and rear CPs; div arty and FA brigade S2s; and counterparts in the aviation brigade and ACR. To engage targets selected for attack by force commanders, FA units must also have rapid access to sensors that detect, identify, and locate targets to the required accuracy. Trigger sensors such as unmanned aerial vehicles (UAVs), joint surveillance and target attack radar system (JSTARS), scouts, reconnaissance helicopters, radars, and special operations forces (SOF), are linked through broadcast intelligence nets, ground station modules (GSMs), and common ground stations (CGSs) to shooters to meet the commander's targeting needs.

2-17. Army attack helicopters, air cavalry units, long-range reconnaissance patrols, and SOF can also acquire targets visually and electronically, call for indirect fires, and perform battle damage assessments (BDAs).

CORPS ARTY AND DIV ARTY TARGET ACQUISITION ASSETS

GENERAL

2-18. FA TA assets under corps and division control consist of weapons-locating radars (WLRs), FISTs, and combat observation/lasing teams (COLTs). FISTs, Strikers, and COLTs are considered primarily FS assets under the control of battalion, brigade, and sometimes division FSEs. Corps arty and div arty HQ only control Firefinder WLRs focused on the counterfire role. Other targeting information critical for the engagement of target arrays developed by corps and division FSCs/FSEs is available through a series of digital and voice communications interfaces (other corps intelligence and operations elements, particularly the ACE, FSC/FSE, and GSMs). The integration of corps arty and div arty into the joint and Army all-source-targeting infrastructure is described in FM 6-20-10, *Tactics, Techniques, and Procedures for the Targeting Process*.

2-19. The primary mission of the AN/TPQ-36 and AN/TPQ-37 WLRs is to detect and locate enemy mortars, artillery, rockets and missiles quickly and with

sufficient accuracy to permit immediate engagement. Their secondary mission is to observe registrations and to help fire direction centers (FDCs) adjust fires. For detailed information on characteristics and employment considerations see FM 6-121.

2-20. As indicated in Section I, corps artys in corps with non-mechanized infantry divisions have one CTAD per airborne, air assault, or light division. These CTADs are equipped with two AN/TPQ-37s, one position and azimuth determining system (PADS) team and one target-processing section. CTADs are normally attached to this division to permit TA to the limit of the division commander's AO and to provide a viable target-processing capability in div arty CPs.

2-21. There are three AN/TPQ-36 mortar-locating radars and two AN/TPQ-37 artillery-locating radars in heavy division TABs. In light infantry divisions, one AN/TPQ-36 radar is organic to each DS FA battalion and two AN/TPQ-37 radars may be attached from the CTAD. FA brigades may be augmented with TA means as required.

AN/TPQ-37 ENHANCED FIREFINDER

2-22. The primary mission of the enhanced AN/TPQ-37 is to locate low-trajectory indirect fire weapons such as rockets and cannon artillery over a range band from 3-50 kilometer (km). It can also be used to locate mortars. The high-mobility, multipurpose wheeled vehicle (HMMWV)-based Enhanced Firefinder incorporates a series of major modifications to include C130/C141 aircraft roll-on/roll-off (RO/RO) capability without special loading equipment, the modular azimuth and positioning system (MAPS), false location reduction, cooling system upgrades, trailer upgrades, longer target detection ranges, and survivability enhancements.

AN/TPQ-36 MORTAR LOCATING RADAR

2-23. The AN/TPQ-36 is the smaller of the two radars, optimized to locate shorter-range, high-angle, lower-velocity weapons such as mortars and shorter-range artillery to a range of 12 km and rockets to 24 km. It has a 6,400 mil search capability in the extended azimuth search function.